

RAILWAY FROM LAKE SUPERIOR
TO RED RIVER SETTLEMENT

JOHN FOSTER

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Queen's University at Kingston



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RAILWAY

FROM

Lake Superior to Red River Settlement,

CONSIDERED

IN A LETTER TO

THE HON. WM. McDOUGALL, C.B.,

MINISTER OF PUBLIC WORKS,

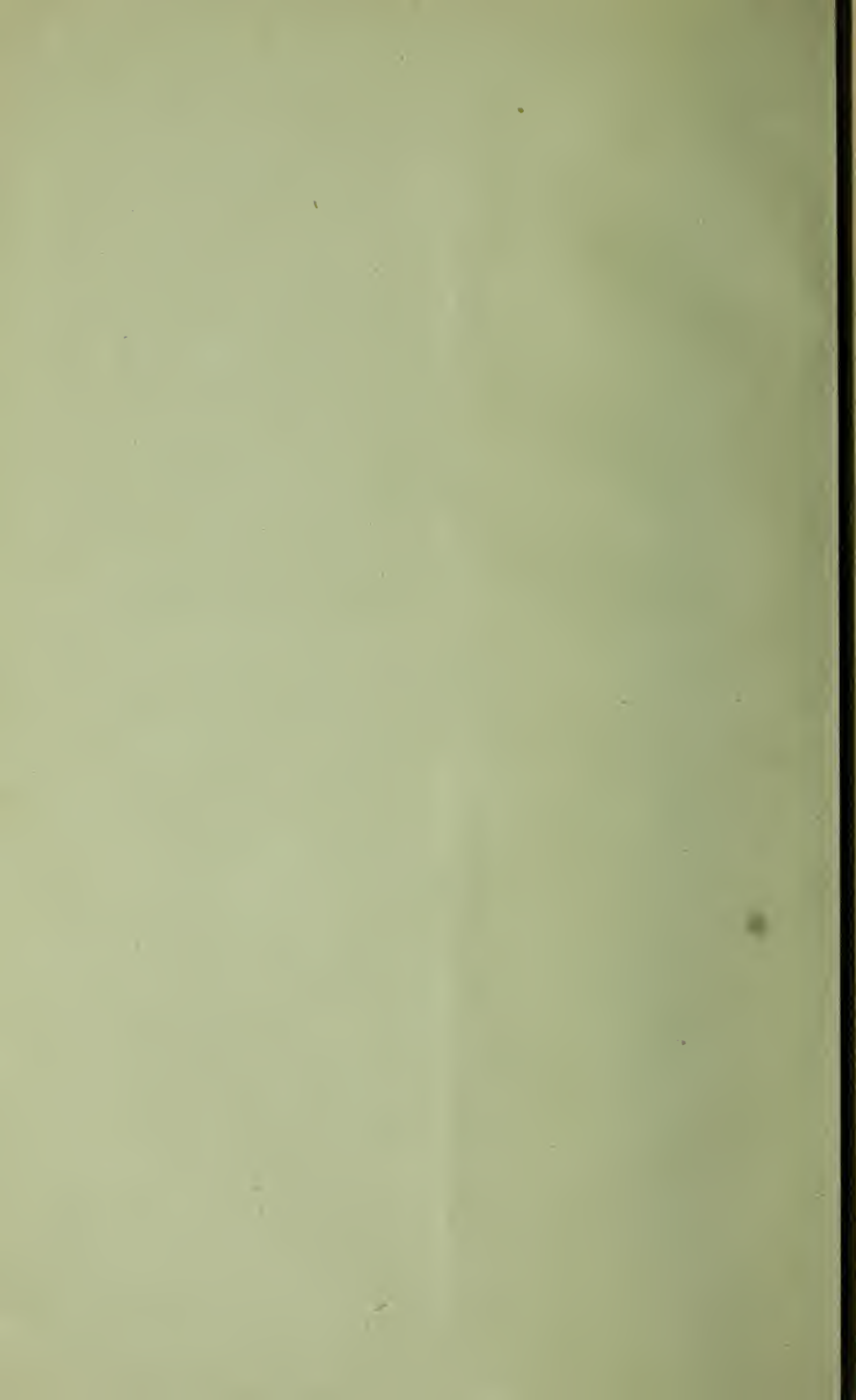
BY JOHN FOSTER.

Montreal :

PRINTED BY JOHN LOVELL, ST. NICHOLAS STREET.

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PRICE 10 CENTS.



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TO THE HON. WM. McDOUGALL, C.B.,

MINISTER OF PUBLIC WORKS, &c.,
OTTAWA.

SIR,

Although it is only little more than a year since Mr. Dawson addressed to you his report on the line of route between "Lake Superior and the Red River Settlement," still the *realisation* of the hopes and expectations of Canada by adding this immense country to the Dominion, furnishes both materials and justification for the liberty I take in addressing this letter to you. There are, I believe, no two opinions as regards the richness and value of the great territory in question, the prairies are second to none on the continent of North America, and immeasurably superior to anything that exists in either Upper or Lower Canada; in a word, the fertility of the land, the salubrity of the climate, and the immensity of this area need not be dwelt upon here; or if necessary the following extract from Mr. Dawson's report will be sufficient on this head to answer all enquiries:

He says "The region is so vast and the soil throughout the greater
" part of its extent so good, that it is no exaggeration to say the
" cultivable lands may be reckoned by hundreds of millions of acres.
" The country is intersected with rivers, one of which, the Saskat-
" chewan drains an area greater than does the St. Lawrence, and is
" navigable for seven hundred miles of its course. From the South
" Branch of this great river, north west to Peace River the climate
" is adapted to the growth of wheat. Coal, salt, iron, gold and bitu-
" men, are among the minerals to be found. Over the untilled
" fields which nature has spread out, the wild cattle of the plains
" roam in countless herds, and for hundreds of miles together may
" be seen grazing like domestic cattle in a field of pasture. A

“ region which thus in a state of nature supports animal life in pro-
 “ fusion, must be naturally rich, as regards its soil and climate. It
 “ is, in fact, equal to sustain as dense an agricultural population
 “ as any area of equal extent on the face of the globe.”

But all this is admitted and the only question I propose to discuss is, how is it to be got at ? The opinion of Mr. Dawson on this point a year and a half ago, is clearly set forth in the report referred to ; a road through the navigable lakes and rivers with portages and ordinary roads to complete the communication being all he considers necessary for the present, and that the idea of a railway, however theoretically good is practically premature ; for he argues
 “ while admitting the great advantages which would result from a
 “ work of this kind, it must be borne in mind that the means for
 “ its construction cannot at present be obtained. There is no
 “ amount of argument, as to prospective advantages, which could
 “ procure the investment of twenty millions of dollars, which
 “ would be about its cost, in an undeveloped region, such as that
 “ through which it would pass,” and further he says : “ before
 “ such a work was undertaken, the country would have to be
 “ rendered accessible, as I have already said, by some such means
 “ of communication as I have suggested.”

Mr. Russell also in his publication of the “ North West Territories considered in relation to Canada” gives Mr. Jarvis’ opinion respecting railways in the following words :

“ He says that many persons suppose that Railways will in a
 “ great measure supersede Canals, but that it is evident that
 “ this conclusion has been reached without consideration, especially when applied to Channels of great trade.” Speaking of the trade of the West, he says : “ In regard to the trade
 “ under consideration, it may be remarked that the great mass is
 “ composed of bulky and heavy articles, of such general value as
 “ materially feels the weight of transport charges, especially if
 “ the distance moved be great, and cannot under the general con-

“dition of the market afford to pay much additional, to save a few days time in transit.”

What I propose to do is to endeavour to change Mr. Dawson's opinion as to the cost of a railway, and to show that Mr. Jarvis' is opposed to all experience. These appear to me to be the only points necessary to establish in order to place on advantageous ground “Railway vs. Water.

Mr. Dawson did me the honor three or four months ago of inspecting a specimen of my new system of Wooden Railway, and was pleased to express a very favorable opinion of its applicability to colonisation purposes—and the piece of experimental line which has been worked over during the spring and summer still remains in proof of this opinion, in as perfect a condition as when laid down. A great many of the most practical men of Canada have expressed the same opinion as Mr. Dawson, and the Engineer of the Northern Colonisation Company reports in favor of its adoption for their line in preference to any other system. The consideration of a railway in connection with this system will, I think, greatly modify the objections advanced by Mr. Dawson, whose estimate of cost was of course based upon an iron road; and by referring to the experience of other nations, I believe I shall show that if a railway can be constructed for a moderate sum, it combines a greater number of advantages for the transport of merchandise, than any system of inland navigation.

Since Mr. Dawson saw my Wooden Railway I have had ample opportunity of considering its construction, and cost; experience has suggested modifications in the former and the interval has enabled me to mature the various tools and appliances for reducing the latter, so as to arrive with accuracy at the cost per mile of a Wooden way.

A word, as regards the feasibility of a line from Lake Superior to Fort Garry. No engineer who has written on the subject suggests even that the work is impracticable, but that generally the ground

is not unfavourable, and for nearly one-third of the whole distance it is what may practically be termed flat. The difficulty of passing through the highest mountainous ranges in Europe, viz : the Alps and Appenines, has not been nearly so great as supposed, nor the expense per mile at all extravagant ; the distance of course is greatly increased, but such works as the tunnel now making under Mont Cenis between France and Italy will never be repeated, for it is much less expensive to go over than under such places, and if this is the case in the Alps, what must it be in such comparatively low elevations as are met with in the West. In proof of this there are already two lines over the Alps, and two more projected from Switzerland, over the St. Gothard and Splugen. The double range of the Appenines is crossed by the railroad from Rome to Ancona, which runs for forty miles in the gorges and among the mountains of this pass ; the cost of the earthwork, bridges, and short tunnels on this section, in fact every thing excepting the permanent way, did not reach £8,000 sterling per mile (\$40,000). The permanent way was excessively costly, as the rails had to be carted all the way from Rome on the one side and Ancona on the other, and were dragged for many miles up to the places inaccessible to any carriage, two or three and sometimes one at a time, by buffaloes.

My Wooden system will remove entirely one great objection advanced by Mr. Dawson against railways, viz : That roads of communication, almost as expensive as those he proposes, must first be constructed in order to render the country accessible for the materials required on the line.

No such roads of communication would be required for the construction of a Wooden Railway ; all the materials would be found on the ground, and the commencement of the different sections would take place in, or close to, the woods furnishing the supply, and the conveyance of the materials, &c., would be over the line as it was laid. The only requisites for the construction of the

wooden rails would be light tools, and in some instances where water power was not attainable, steam engines of small power for working the saws and planes, all of which may be made in pieces so light as to be carried on horses' backs. Machinery of a similar portable description I have myself constructed years ago for the interior of India. The cost of the construction of a wooden line of railway across a prairie, with full allowance for bridges, culverts, and the rail 2 feet above the prairie level would be largely provided for, with \$4000 per mile. The air line distance from the Southern extremity of Lake Winnipeg to Fort William on Lake Superior, is 350 miles. Fort Garry will be about the same. Commencing therefore at this latter point, we have distance from Fort Garry to the North West Point of the Lake of the Woods 90 miles, increased 10 per cent. for deviation from a direct line, say 100; from the same point of the Lake of the Woods to the South shore of Lake Sturgeon, 168 miles, with 15 per cent. for deviation, equal 193; and from Lake Sturgeon to Fort William 92 miles, with 33 per cent. for deviation 122 miles; or 350 miles direct distance and 415 by the railroad.

The whole of the section from Fort Garry to Lake of the Woods is across the most favorable country for a railway. We have therefore,

FOR OUR ESTIMATE.

1.	100 miles from Fort Garry to Lake of the Woods.....	}	100 at \$ 4000	\$400,000
2.	193 from Lake of the Woods, to Lake Sturgeon.....	}	90 " 6000	540,000
			60 " 10000	600,000
			30 " 20000	600,000
			13 " 40000	520,000
3.	122 from Lake Sturgeon to Fort Wil- liam.....	}	50 " 6000	300,000
			40 " 10000	400,000
			20 " 20000	400,000
			12 " 40000	480,000
<hr/>			<hr/>	<hr/>
	415		415	4,240,000

Forward.....	4,240,000
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STATIONS.

It is difficult to determine this figure, as in all probability but very few stations will be required. Halting places, for the supply of wood and water, with carpenter's and blacksmith's shop, will however be desirable at frequent intervals.

4.	2 principal stations, at each end of the line, with repairing shops, water tanks and engine sheds, offices, &c., at \$100,000 each	200,000
5.	8 intermediate stations of some importance, with repairing tools, water cranes and house for single engine, \$25,000 each.....	200,000
6.	40 halting places, answering for stations, watering places, with carpenter's blacksmith's shop, &c., at \$5000 each.....	200,000
7.	40 miles of siding at the various stations, including crossings, at \$4000 per mile.....	160,000

ROLLING STOCK.

8. Although the traffic on this line, at the commencement, cannot be expected to be very great, still, from its length, and delays which always occur in loading and unloading in new countries, a considerable number of cheap goods waggons will be required.

20 locomotives would well work the line, besides 8 which would be kept at the intermediate stations.

Take the rolling stock at:

400 goods waggons, at \$300 each	120,000
100 other cars, at \$500 each.....	50,000
28 locomotives, at \$15,000 each	420,000
9. Various expenditure	410,000
	<hr/>
	\$6,000,000

I believe the above figure would be considerably reduced if the superiority of wood over iron in rising grades was made use of to its

greatest extent, but this I consider would be undesirable. Admit, however, occasionally, the same grade as employed on iron lines in Europe, and I would instance the Turin and Genoa line, over which there is a heavy merchandise traffic equal to any line out of England, and where the steepest grade is $3\frac{1}{2}$ centimetres per metre (or about 175 feet per mile) for a length of $3\frac{1}{2}$ miles; a grade comparatively easy on a rail made of wood with the *grain endways*.

The question of cost, therefore, will, by the system I propose, be enormously reduced.

The next point of consideration is, whether a railway is the most desirable means of communication; and, in fact, suitable when "applied to channels of great trade." Mr. Jarvis' opinion is, that it is not, and that the conclusion arrived at by many people, that railways will in a great measure supersede canals, is "reached without consideration." With this opinion I am at direct variance, and will endeavour to show that experience generally is opposed to this view.

As regards England in this matter, it may be urged that the comparison there is not a fair one, as fuel is cheaper than anywhere else, and the canals were not in the best condition to contend with transport by railway.

I will therefore pass to France, where fuel is not cheap, and where the canals and rivers constituting their water communications have been all laid out and executed by a body of engineers, as scientific and experienced in these works as any in Europe.

What have been the results on some of the most important lines in France? Take the "Chemin de Fer du Nord," from Paris to Lille and Valenciennes; the line from Paris to Strasbourg, from Strasbourg to Mulhouse, from Paris to Lyons, and from Paris to Orleans. I take them as representing "the channels of great trade." The "Chemin de Fer du Nord" has to contend with a line partly composed of canals and partly of navigable rivers, and the struggle has been long and fierce, but has resulted as shewn by

the following figures, from the report of M. Minard, "Inspecteur Général des Ponts et Chaussées," in railway superiority.

In 1850, the total tonnage carried the whole distance between Paris and the Belgian frontier by railway was.....	240,000 tons.
by water	956,000 "
In 1855.....by railway	850,000 "
by water	1,124,000 "
In 1858.....by railway.....	1,350,000 "
by water.....	1,500,000 "

Shewing an increase of tonnage by canal in 8 years of about 60 per cent., and by railway of nearly 600 per cent.

In 1858, the transport by water fell 20 per cent., that by railway remained stationary, and the last ten years has rendered the difference still greater, and this, where coal and iron constitute the large proportion of the merchandise.

The Paris and Strasbourg has to contend with a water communication by the Marne and the Rhine, and their canals; and here, in eight years, the railway had increased their receipts for merchandise four millions of francs per annum, and this, notwithstanding an opposition line from Mulhouse to Paris almost parallel with it. The Strasbourg and Mulhouse line has to contend with the navigation of the Rhone and the Rhine, and their connecting canal, and here the canal company have lowered their tariff so as hardly to pay the expense of repairs and administration, the railway, having absorbed two-thirds of all the merchandise transported by canal.

The Paris and Lyons line has to contend with the navigation of the Seine and the Yonne and the Bourgoyne Canal, and the Government Statistics shew the following results: A part of this line was delivered to circulation in 1848. In 1847 the tonnage by canal was 202,688 tons—in 1850 this fell to 179,152 tons.—Later when new sections of the railway were opened the diminution continued—in 1852 it was reduced to 125,838 and in 1853 to 80,000 tons.—In 1854 a consi-

derable reduction of the canal tariff took place, and raised the tonnage in that year to 153,000.—In 1858, however, it had again fallen to 88,000—since which time the improvements in the economy of railway transport has more than kept pace with those in water navigation.

The Paris and Orleans Railway has the navigation by the Seine and the Loing and Orleans canal to contend with—but forced a reduction of 40 per 100 from the tariff, notwithstanding which the railway almost monopolizes the trade, the tonnage in 1858 by rail being 934,000, by water 50,000 tons.

From canals we will pass to navigable rivers without locks, transshipment, breaking bulk, or other impediments. First, of the Seine, from Paris to Rouen and Havre, the government reporter says—“ Even here, the tonnage for railway during the last few years has increased more rapidly than that by the river.”

“ From Orleans to Tours the tonnage per rail is 518,000—against 123,000 per water. From Tours to Nantes the quantity is about the same per rail and water.”

From Rive-de-Gier à Givors, where also a canal and railway are almost side by side; the Directors of the former after many years hard struggle finishing by declaring their inability to compete with the railway, and many of the Directors being the same on both boards, some compromise was effected.

I conclude therefore from the foregoing that those persons who maintain “ that railways will in a great measure supersede canals ” are right, and that they are especially applicable to channels of great trade, for even the trade of the greatest lines in France is very far from representing the traffic on the North Western, Great Western, and many other lines in England compared per mile or per kilometre. And it must be borne in mind that all this immense increase of internal commerce in all the nations of Europe varying from 3 to 20 fold is altogether due to the development of the resources and industries of the countries by means of railways.

I will now consider the question of the cost of transport per rail ;

and it will strike every one at first that it cannot be much dearer than by canal, or so large a proportion of the tonnage would never be carried on the rail. In England millions of tons of coal, iron, minerals, manure, &c. &c., are carried at $\frac{1}{2}$ d. per ton per mile. In France, all the great lines of railway transport plaster, stones, wood, grain, coal, &c., and all heavy articles of small comparative value at 3 and $3\frac{1}{2}$ centimes, ($\frac{2}{3}$ to $\frac{3}{4}$ of a Canadian cent), per ton per kilometre—a rate equal, if not inferior to water conveyance.

We will now come nearer home and examine the cost of transport per rail and water in the States. In the annual Report of the Engineers of the State of New York on the State Canals, I find the cost of transport on the Erie Enlargement and the New York and Erie Railway, side by side, the result being *1.08 cent

* This amount corresponds so nearly with the cost per canal between Paris and Strasbourg but differs so materially in regard to that per rail, that I think the following extract translated from the French report will be found interesting:—

“From Paris to Strasbourg the transport is effected by the Marne and Rhine canals, the cost of the whole amount of tonnage conveyed from the 10th March, 1855, to 10th March, 1856, averaged 3.60 centimes per ton per kilometre and is divided as follows :

	CENTIMES.
Cost of haulage.....	2.36
Transshipment at Cumières and Mary.....	20
Cordage, oil and small expenses.....	20
Assurance	19
Trade charges of all sorts	51
Interest on capital and sinking fund.....	07
	<hr/>
	3.60

In this calculation a fair allowance has been made for empties.

In general, the cost on canals of large section and few locks, admitting of boats carrying from 180 to 200 tons, and allowing for empties, is from 1 centime and a $\frac{1}{2}$, to 2 centimes, according to the proportion of empties; on canals of small section with frequent locks, and admitting boats of a tonnage not exceeding 60 to 100 tons, it will reach 3 or 4 centimes. On a railway with average grades, and full loads, as is the case with coal, the cost of traction alone is very trifling, not exceed .0037 centimes, or about 4-10th of a centime per ton per kilometre, but if the trains have not full loads, which is generally the case, the expense for empties will considerably increase the cost; thus taking the total traffic on the Strasbourg line for the year 1859, it amounted to .0037 centimes, or

per ton per mile by canal, and 1.73 cent per railway, but it is not shown how this is composed. This would give a decided advantage to water communication in this State, (I do not refer to the other canals as the Erie Enlargement monopolises nearly the whole of the water traffic, and all the other canals with only two exceptions shew a deficit.) It appears however that it was found necessary to protect this canal by a legislative act forbidding the transport of merchandise by the railway during the season of navigation, and thus placing the railway under immense disadvantage. I am not aware whether this act is still in force, but it will easily account for the excessive price on the rail, when this report was made.

It is hardly necessary to say that I don't propose to apply either the French or English or American tariff to the line between Fort William and Fort Garry; if I did, the transport from Fort Garry to Lake Superior would cost only 4 dollars per ton, but I consider double the American tariff, or 3.50 cents per ton per mile, ought to be a large and sufficient price, and would bring the cost per ton under 15 dollars; and by no other conveyance could it be done so cheaply.

about 1 centime and 7-10th per ton per kilometre. This figure does not include the maintenance of the permanent way, or service or interest of material, &c. Taking all these expenses into consideration, the average cost of merchandise of all descriptions, amounted to about $4\frac{1}{2}$ centimes per ton per kilometre, and is composed as follows:

	CENTIMES.
Maintenance of permanent way	0.0060
Traction.	0.0173
Clerks, warehouse men and laborers..	0.0116
Central service and sundry expenses.	0.0023
Renewal of road and material.....	0.0076
Total.....	0.0448

(this is equal to 6 centimes per mile or 1.20 cents.)

It may here be observed that the Strasbourg line is a bad average as regards the cost of transport, as the return of empties, or light trains is very frequent.'

This would also be modified, when another source of income which I have not yet noticed, developed itself; for, by a railway, *people* as well as *things*, would be carried, and the former source of income would be an important element in the reduction of the transport of goods. Bring the Red River settlement within 40 hours of Lake Superior, and this element will soon shew itself; there will no longer be the feeling of isolation and banishment which, in the eyes of all emigrants and particularly the better class, is the great stumbling block. From Montreal it will be no great journey either for the colonist or man of business, and many will go there merely to judge for themselves before deciding upon settlement. It will soon be known that there is no land superior to be found, and no climate on the continent more salubrious, promoting hearty and robust health, and not the yellow skin and dried appearance which those settling in many of the richest Western States of the Union acquire in so short a time.

A railway for emigrants, business men, and travellers generally, is absolutely necessary unless it is intended that all these should go and come by the States, and not only these, but the produce and supply also. The Americans have their line already two-thirds of the way through Wisconsin and Minnesota and all the distant States are developed by this means of communication, and the Red River Settlement will practically add another to the number, unless the commerce of Canada can have equal facilities and advantages. If there is nothing to oppose to their railway up to Fort Garry but a line of lake, canal and common road communication, the experience of other countries ought to be accepted as it has shewn the result to be expected. Russia is covering her great surface with railways, in fact no two nations can run a fair race if one is to ride on a locomotive and the other in a canal boat.

What then is the great impediment suggested as likely to interfere with placing the country in this position? *The difficulty of raising the money necessary* for carrying out the work! And is this

really so ? Is it true that Canada which boasts that shortly she will form a Dominion to compare with the United States on this side the Atlantic and with Russia on the other, and really having all the elements of equalling either in prospective wealth, is it true that she recoils before the self imposed task of developing her newly gained lands ? Is it true that Canada, whose people have claimed this bright territory in the West for years, and have at last obtained it, that this Dominion in whose keeping alone the period of perfect independance rests (a day nevertheless which will bring sincere regret to every loyal Englishman whenever it may occur,) is it true that her resources are so crippled, that the government of the country cannot afford to lend its credit for such an imperial purpose, but collapses before the finding of a few millions of dollars ? Universal opinion denounces such a conclusion, the great future of the Dominion, the spirit of the people, the enlarged aim and views of the government and yourself are a guarantee that this great question will be handled in a manner worthy of its importance, important in a degree which can hardly be exaggerated ; and whether the great line of railway communication is established upon the system I propose or a better, or a worse, let immediate and mature consideration decide, and action quick and energetic, follow that decision whatever it may be, or the commerce of the country in question must go to those who will show superior enterprise and intelligence.

Admitting six millions to be the sum required to make this line, and supposing the government were to grant an issue of Bonds exclusively for its construction, is there no way of redeeming the amount in the future, and paying the interest or a great part of it during the earlier years ? I think there is, and that from the millions of acres of land in that region, an immense revenue may be obtained. Let the government so soon as they have possession, refuse to acknowledge any title to land that is not held from it, (excepting always that already occupied.) Ever so

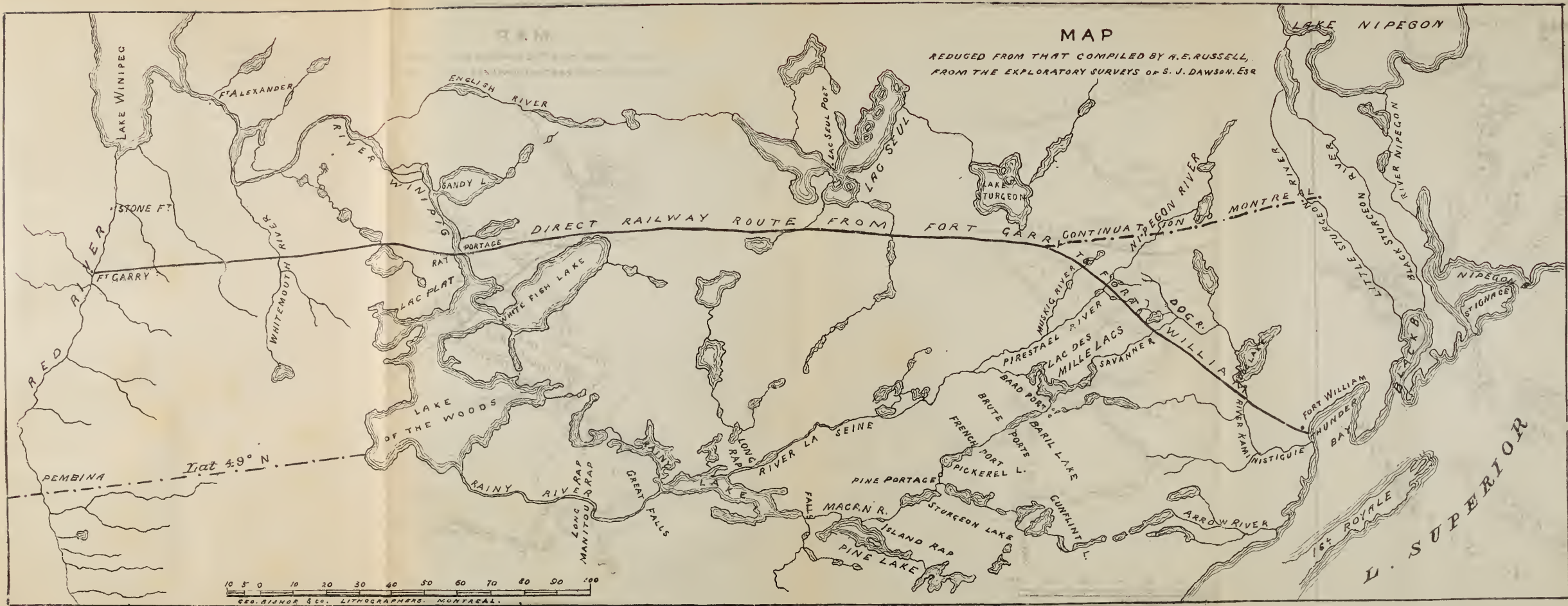
moderate a price would in the course of years yield an enormous revenue, and colonisation carried on with some sort of order and method would be of immense advantage to both settlers and the government. These prairies if rendered of easy access would tempt quite a different class of settlers from those who inhabit the woods and swamps of many parts of Canada. The years of labor required to make a farm here would be all saved, and a few agricultural implements would in one season place the emigrant, with his market road already made, in a better position than years of toil do here ; he would not be shut out from the world in the bush, but would begin to live from the moment he arrived, and escape altogether that interment in bog and forest, inseparable from an uncleared country.

I am, Sir,

With great respect,

Yours most obediently,

JOHN FOSTER.





FOSTER'S

NEW SYSTEM OF WOODEN RAILWAY.

The novelty of this system consists in presenting the grain of the wood endways to the endways of the locomotive and carriage wheels. The immense resistance which wood placed endways opposes to either a crushing or grinding action is proved by its use in preference to either brass or iron for the steps of the vehicle shaft of mills, as well as by its application to the gearing of the heaviest toothed wheels; and the piece of road on this system laid down between Lanoraic and Industry establishes beyond doubt its perfect resistance to the weight and traction of a locomotive.

Among the many advantages claimed for this system are the following:

1st. Economy of construction and durability. It is cheaper than any combination of iron and wood, and from the injurious effect which the intense cold of this climate has upon an iron permanent way, by destroying all its elasticity and rendering the rail itself (no matter what its quality) most susceptible of fracture, it is believed will last quite as long; the strap rail frequently employed is both costly and dangerous, requiring also constant repairs, and the plain rail of hard wood laid lengthways has been repeatedly tried, and as repeatedly failed.

2nd. It enables you to grade a line much cheaper, as the adhesion of the driving wheel of the locomotive to the grain of the wood, endways, is far greater than it is on iron; consequently you can ascend steeper grades and thereby greatly economise in the construction of the line.

3rd. From the great surface presented by the longitudinals, as well as transverse bearings, and the fact that the rail is practically a continuous one, much less, and very frequently no, ballast will be required.

4th. The facility of repairs is also great, as any piece forming the running surface of the rail can be removed, by driving back two wooden pins, and without lifting the rail, be replaced by another.

5th. It is comparatively noiseless, smooth and without vibration, consequently the wear and tear of the machinery of the engine and cars, and the tyres of the wheels of both, are reduced to a minimum.

6th. It will form a substantial wooden permanent way, fulfilling all the necessary conditions of an iron one, and thus in a financial point of view is well worthy of the consideration of the Government and country, as a small part only of the millions of dollars which must be sent abroad to pay for iron rails, would be applied in the country to the manufacture of wooden ones, the large balance being entirely saved.

7th. It can be elevated above snow level for less than the necessary grading, ditching and ballasting across even a level country will cost, as the great strength of the rail itself forms its own girder from pile to pile. By this means the use of the line is assured through the winter.

The cost of this wooden permanent way suitable for a 25 ton engine, running 20 miles an hour, will be about 1 dollar per lineal yard, that is for the rails on both sides, keys, sleepers and laying.

In many situations a narrow gauge line of 3 feet may be constructed with advantage, and would cost, through a country presenting no great difficulties, and with no wide rivers to pass, about \$3000 per mile, including all grading, fencing and culverts, with Rolling Stock, small stations, engine shed and repairing shop.

A rail, full size, may be seen at the WOODEN RAILWAY OFFICE, St. Patrick's Hall, Craig Street, Montreal, and all particulars obtained.

